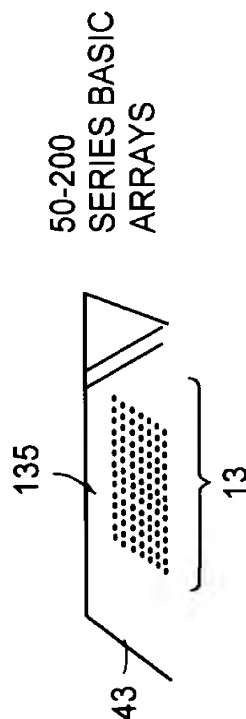


FIG. 1A

VALIDATION - PHASE 1

- VERIFICATION OF INITIAL ---
--SCREENING RESULTS

- ESTABLISH CELLULAR -----
--LOCALIZATION & ANATOMIC
-DISTRIBUTION

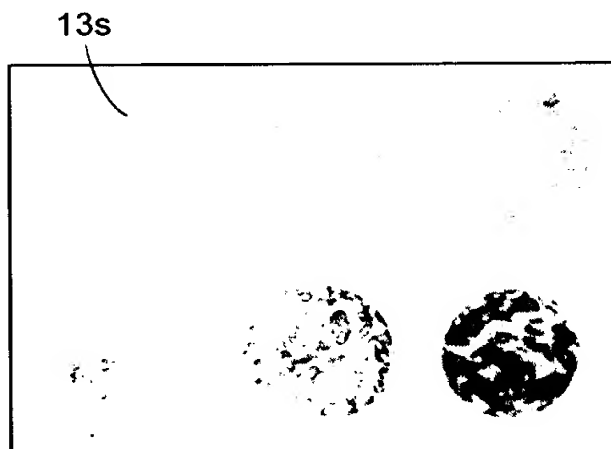
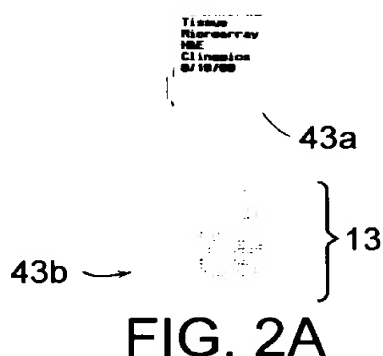


50-200
SERIES BASIC
ARRAYS

FIG. 1B



3/28



SIX TISSUE ELEMENTS FROM A PathWork™ BreastArray BR50 STAINED WITH CK7 SHOWING SELECTIVE STAINING (400X). TISSUE ELEMENTS ARE 0.6mm DIAMETER AND SPACED 0.3mm APART.

FIG. 2C

		45								
	46	┌───────────┐								
46		1	2	3	4	5	6	7	8	
a		0	0	0	0	0	0	0	0	— 45s
b		0	0	0	0	0	0	0	0	
c		0	0	0	0	0	0	0	0	
d		0	0	0	0	0	0	0	0	A
e		0	0	0	0	0	0	0	0	
f		0	0	0	0	0	0	0	0	

a	0	0	0	0	0	0	0	0	0	B
b	0	0	0	0	0	0	0	0	0	
c	0	0	0	0	0	0	0	0	0	

FIG. 2B

Pathworks
CPB-502
Breast PNC1
HSE
C11111111
7/19/00

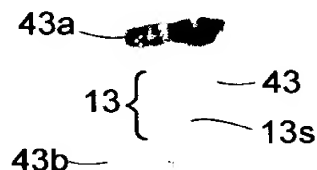


FIG. 2D

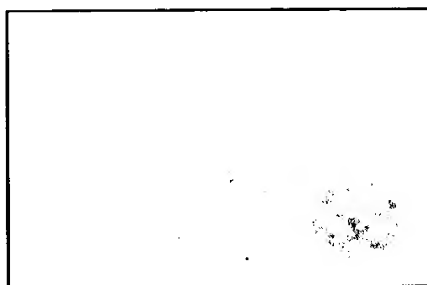
SAMPLE DATA SHEET INFORMATION (FOR ONE TISSUE ELEMENT, LOCATED AT A1) PROVIDED WITH EVERY PathWorks™ Tissue MicroArray

CAT. #	BR50	MITOSES:	1
LOT #	07	PT:	1
COORDINATES:	A1a	pN:	0
ORGAN:	BREAST	LN POS	0
CATEGORY:	BREAST CANCER, DUCTAL	LN ALL	23
SEX:	F	TUMOR DIA.	15
AGE:	67	SURGERY:	MASTECTOMY
BRE GRADE:	G2		
TUBULI:	3		
POLYMORPHY:	3		

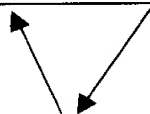
FIG. 2E



4/28



TISSUE MicroArrays



Tissue
Microarray
H&E
Clinomics
8/18/00

- DEVELOPMENT OF POPULATION DATABASES
- HIGH-THROUGHPUT IN SITU ANALYSIS OF DNA, RNA AND PROTEIN
- DISCOVERY OF DIAGNOSTIC AND PROGNOSTIC CORRELATIONS
- TARGET PRIORITIZATION



FIG. 3

FIG. 4A

CLINOMICS BIOREPOSITORY SYSTEM

Clinomics Biorepository Application - [frmSpecimenEntry : Form]

File Edit View Insert Format Records Tools Window Help

Specimen Entry Form

Pathology # Lookup Pathology #

Collection Date Age at Collection Received Date Received Tech Specimen Type Amount

Medication Con Medication Metastasis Site Evidence Treatment TNM Staging

Chemotherapy Chemo Date Radiation Therapy Radiation Date Node Status Surgical Biopsy

Primary Site Tube Type Surgical Resection

Sample Data

ClinomicsID	Description	Location	Sample Type	Amount	Quote#
000002841		TPA, A, tubes	FFPE	block	0
000007489	Breast cancer	TPA, A, tubes	S	100 mg/l	0
000007491	Breast cancer	TPA, B, bags	FFPE	100 Mg	0
000007492	Breast cancer	TPA, B, bags	FFPE	100 mg	0
000007493	Breast cancer	TPA, A, tubes	FFPE	100 mg	0

Record of 4771

Form View

DATA ENTRY



6/28

FIG. 4B

BIOREPOSITORY DATABASE

Microsoft Excel-Book1

File Edit View Insert Format Tools Data Window Help

75%

Arial

10

B

U

F3

= Breast cancer, ductal

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	ID	Coordinate	Tissue Type	Age	Histology	PT	PI	Block #	Nodes Exam	Exam char	Stage	Resected Margin	Stage		
2	744	Aa1	Breast	67	Breast cancer, ductal	1	9	23	0	15cm	Mastecto my		1		
3	745	Aa2	Breast	31	Breast cancer, ductal	2	1	40	0	2.5cm	Mastecto my		2		
4	746	Aa3	Breast	85	Breast cancer, ductal	2	3			4.5cm	Mastecto my		2		
5	747	Aa4	Breast	65	Breast cancer, carcinoma	2	x			2.9cm	Lumpecto my		2		
6	748	Aa5	Breast	76	Breast cancer, ductal	1	x			1.0cm	Lumpecto my		1		
7	749	Aa6	Breast	70	Breast cancer, ductal	2	0	12	0	2.7cm	Lumpecto my		2		
8	750	Aa7	Breast	67	Breast cancer, ductal	1	1	9	3	1.5cm	Lumpecto my		2		
9	751	Aa8	Breast	60	Breast cancer, tubular	2	x			2.3cm	Lumpecto my		2		
10	752	Ab1	Breast	42	Breast cancer, ductal	1	1	17	0	4.0cm	Lumpecto my		2		
11	753	Ab2	Breast	67	Breast cancer, ductal	1	0	26	0	1.0cm	Mastecto my		1		
12															
13															

Ready

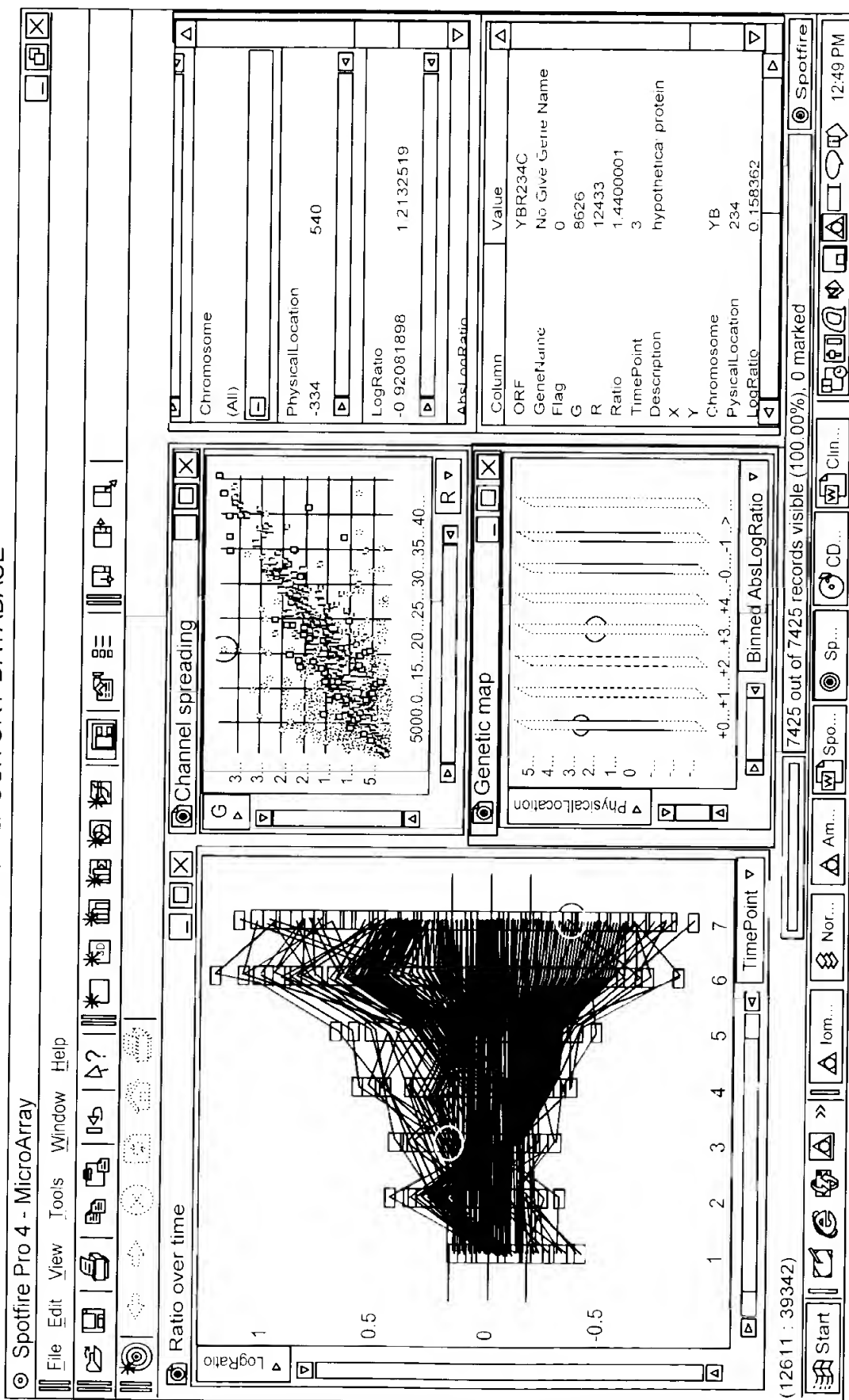
Sheet 1 / Sheet 2 / Sheet 3 /

Start

NUM

10.54 DM

BIOREPOSITORY DATABASE



SORTING AND SELECTION OF PATIENT POPULATIONS
 CLUSTER ANALYSIS

DEVELOPMENT OF EXPRESSION PROFILES VS MEDICAL DATA

FIG. 4C

8/28

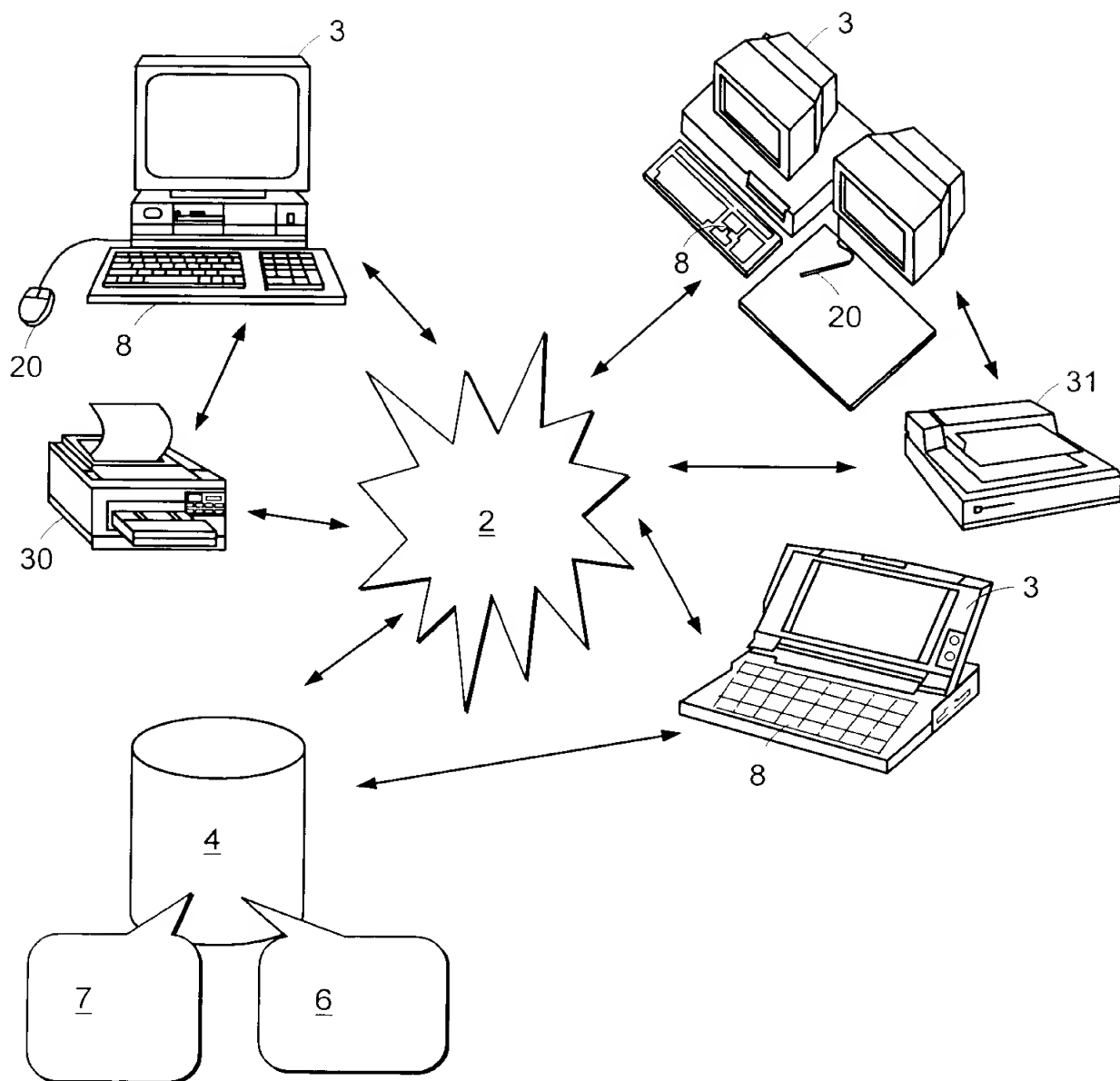


FIG. 5



9/28

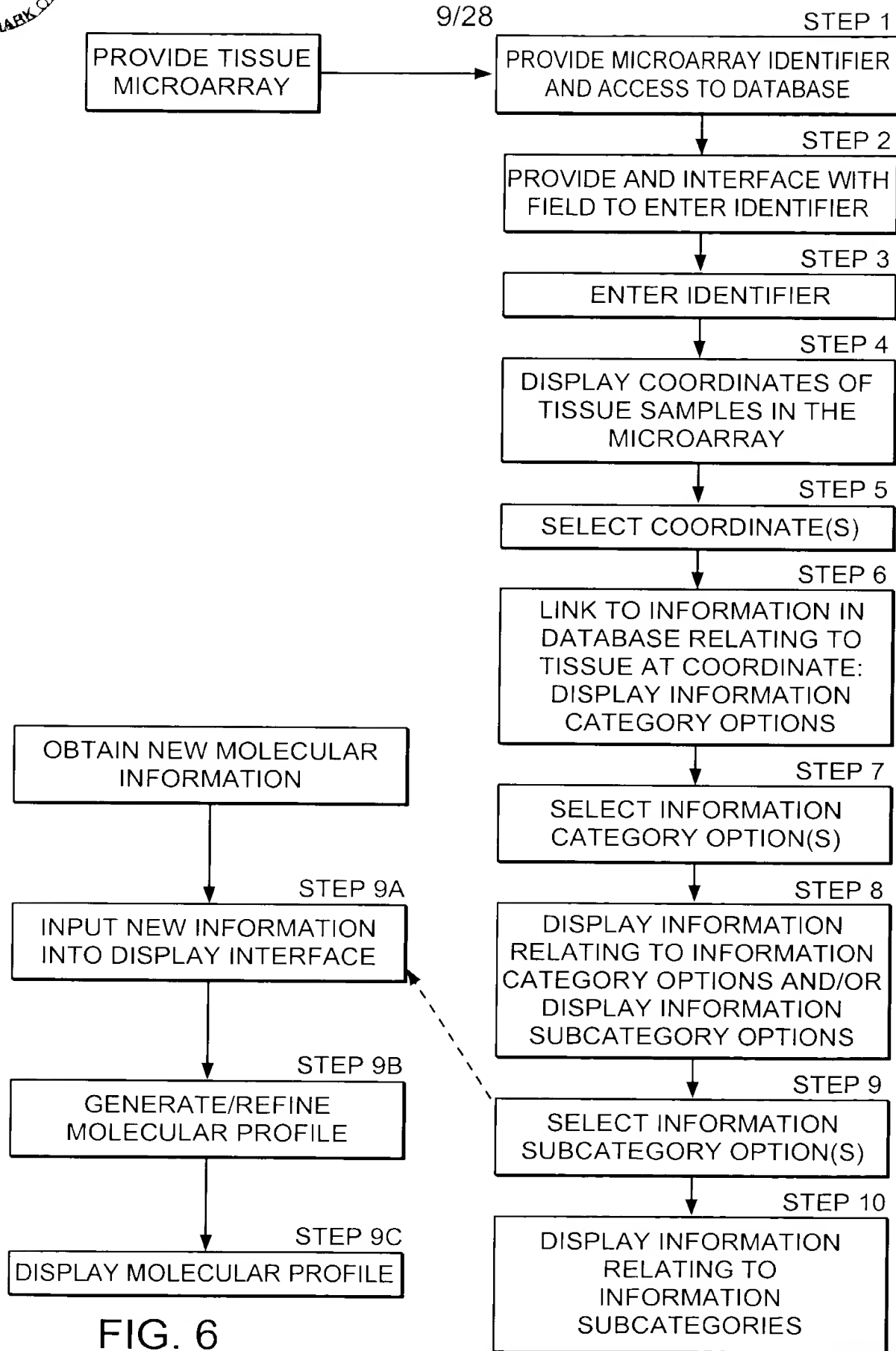


FIG. 6

10/28

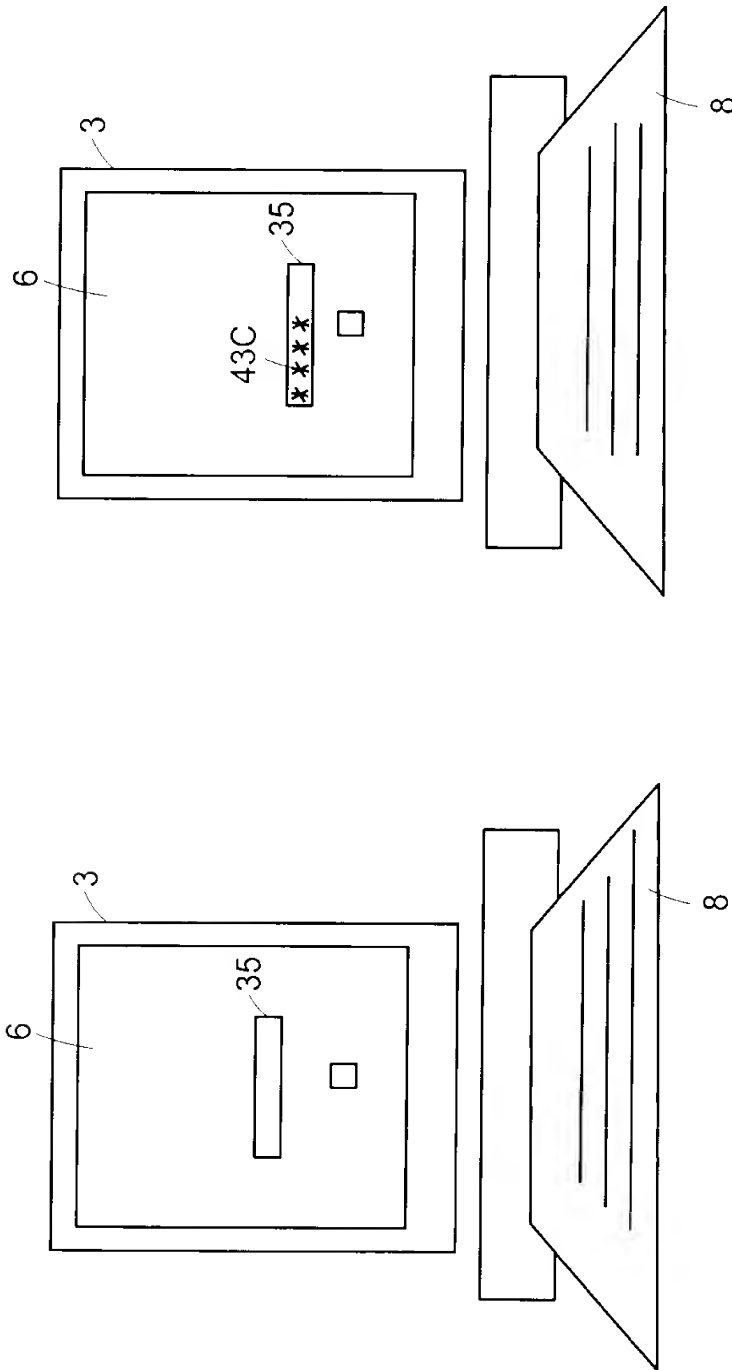


FIG. 7B

FIG. 7A

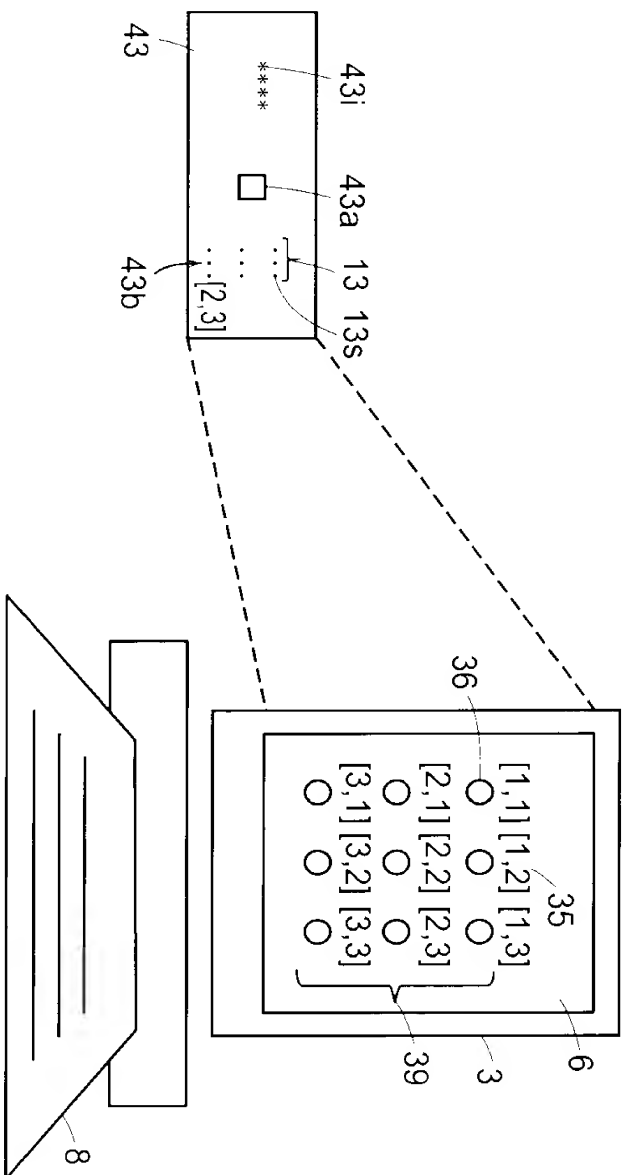


FIG. 7C

12/28

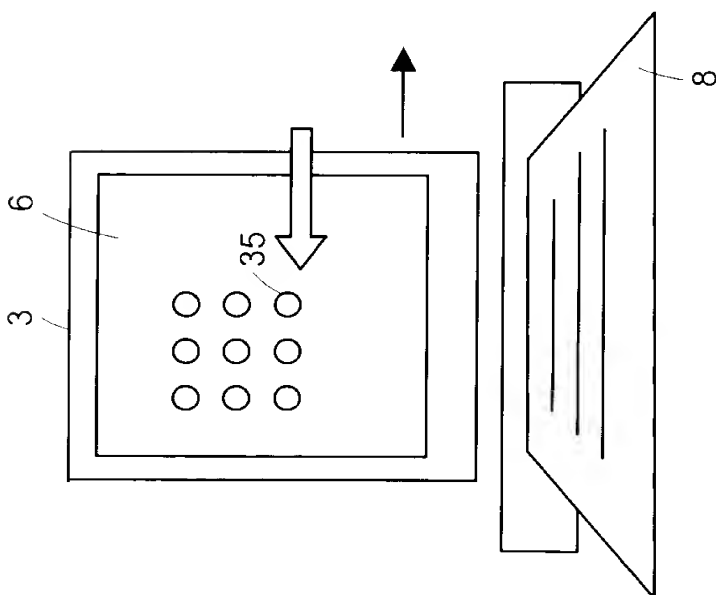
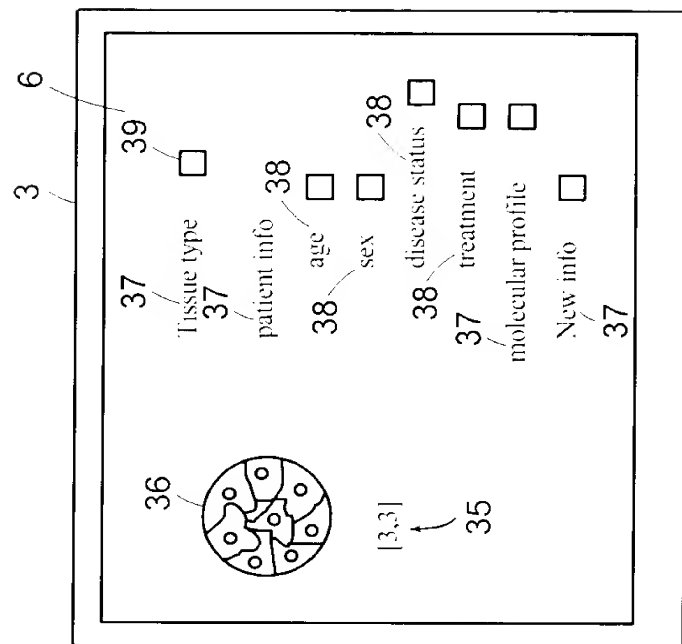
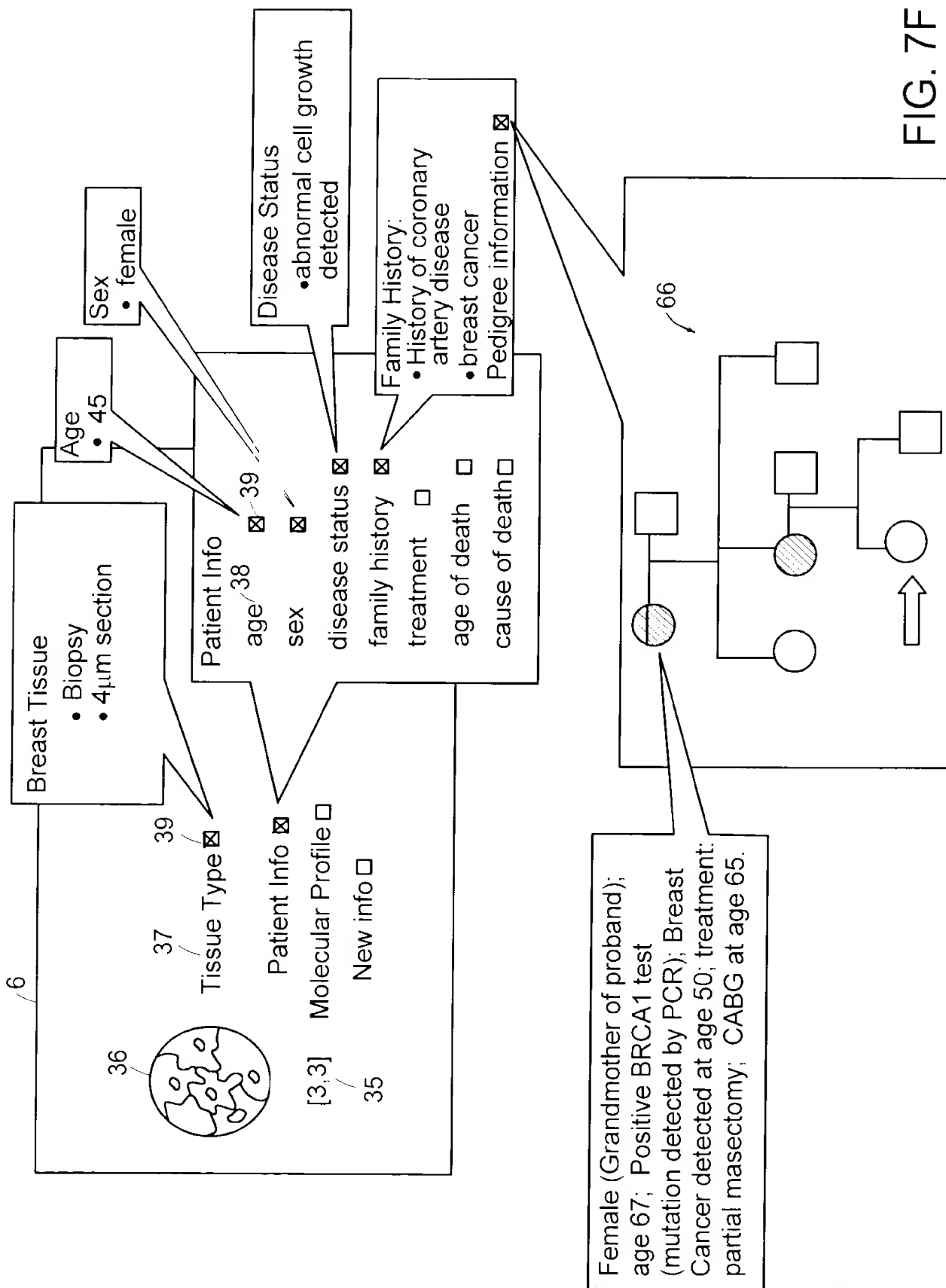


FIG. 7D

FIG. 7E



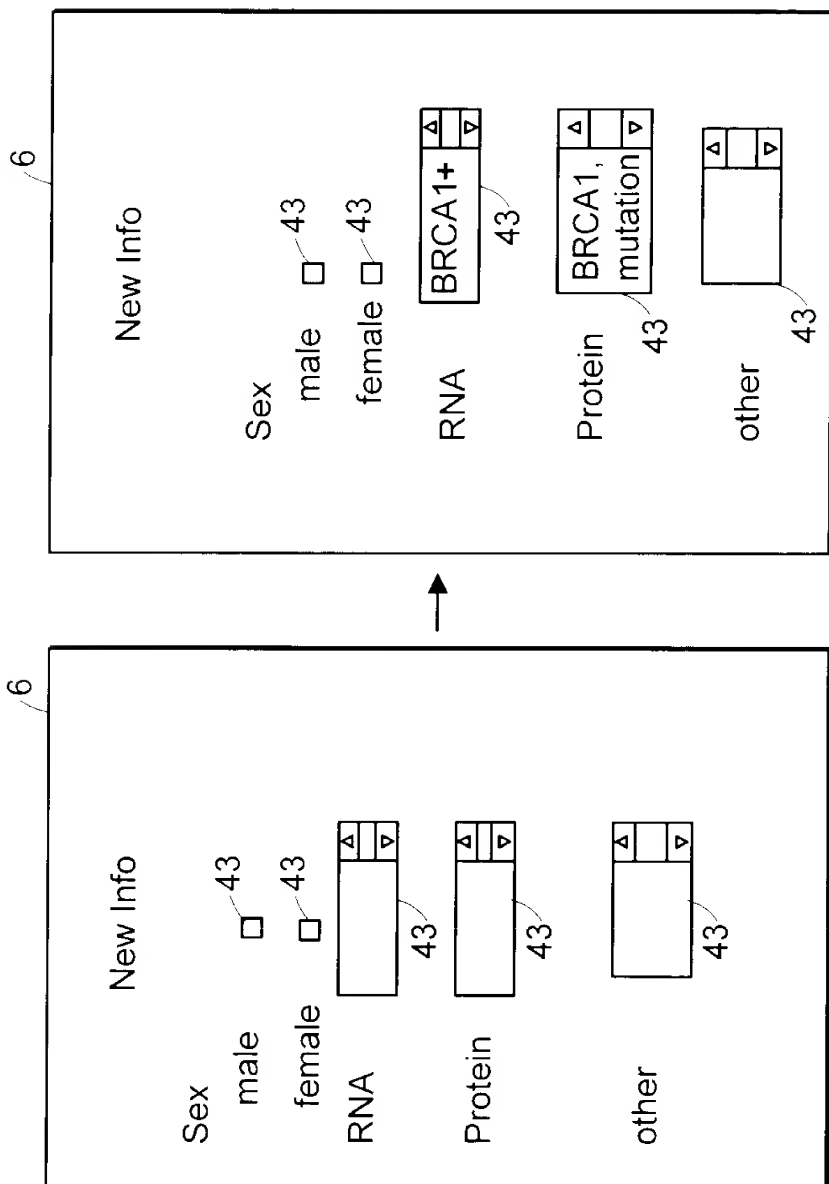
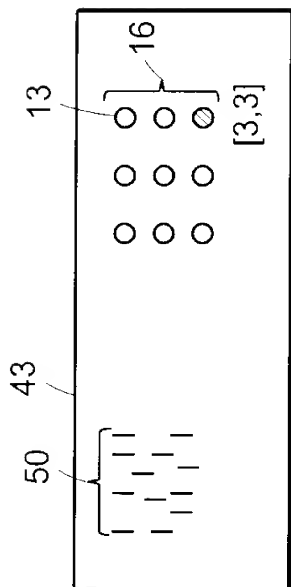


FIG. 7G

32

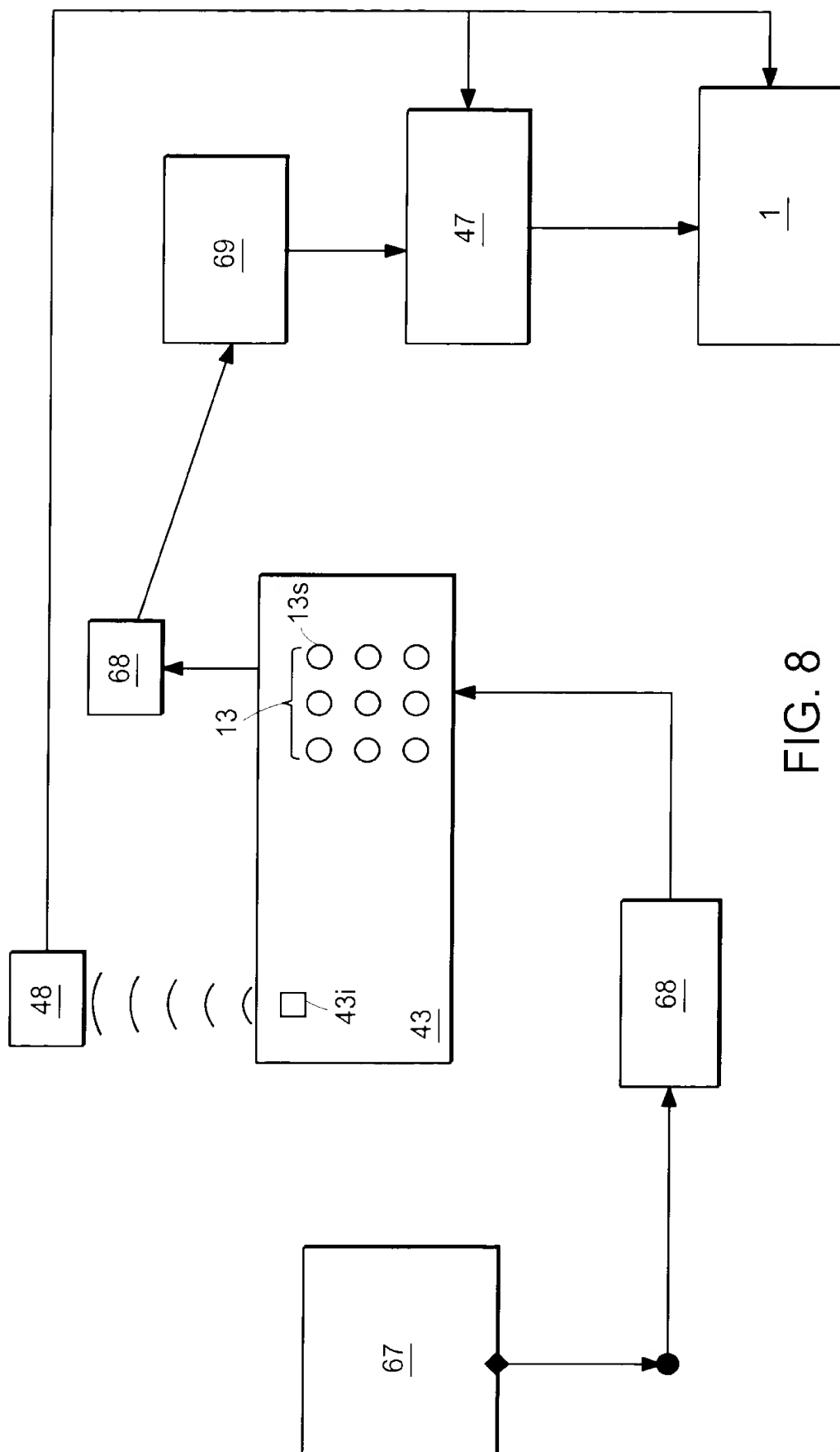


FIG. 8

16/28

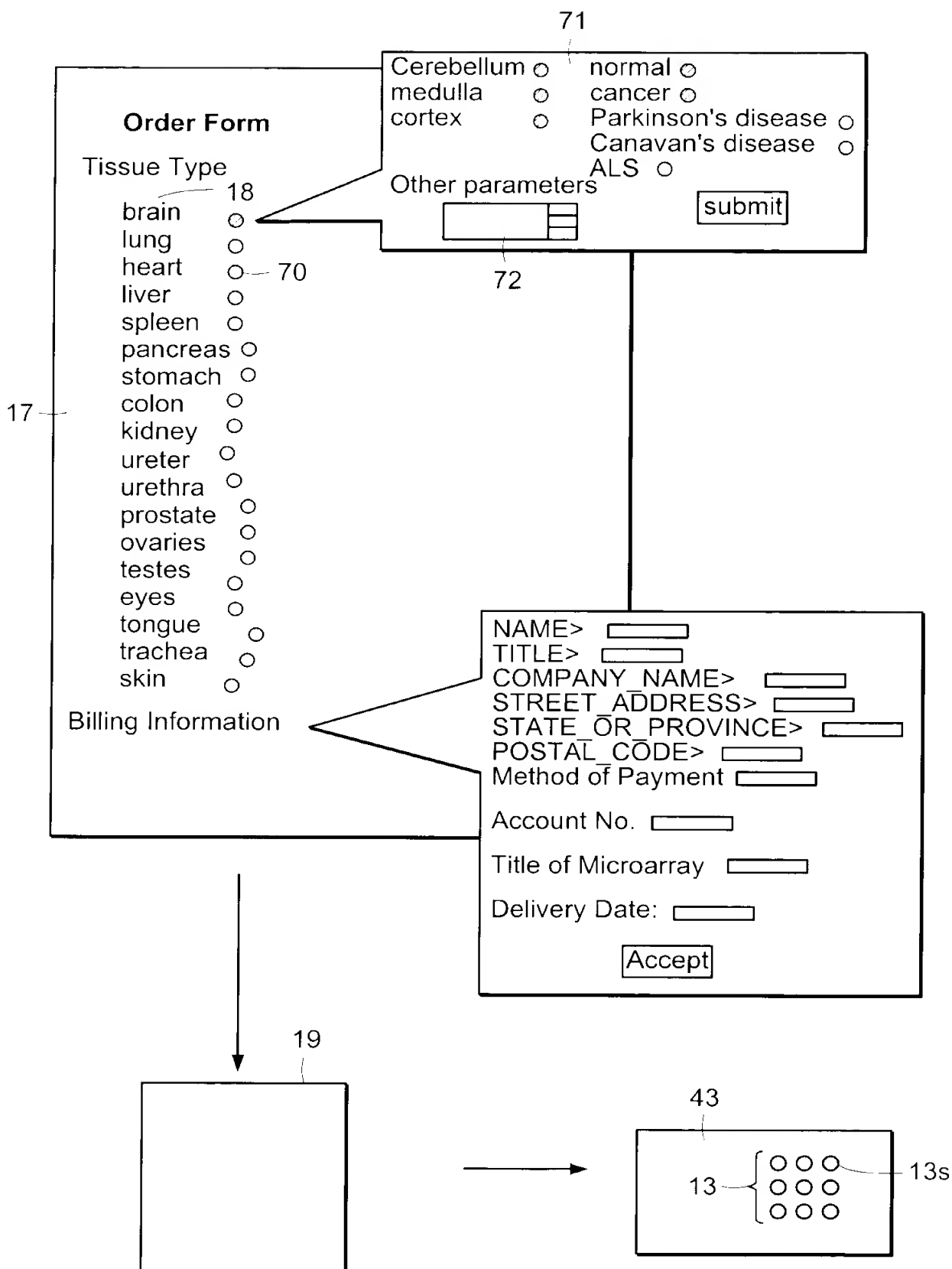


FIG. 9



17/28

FIG. 10

Microsoft Access-[Pathology H-0717-86 to H-0065-87]

File Edit View Insert Format Records Tools Window Help

Pathology # H-0722-86 Clinomics ID 000000006P Age/DOB 83 Sex M Collection Date 4/30/86 Location tissue processing are Tube Type freezer,paraffin Con Medication Valium,Tylenol Evidence Grade 2 Surgical Resection Bladder CA-15-3 Progesterone NA Estrogen NA

Primary Diagnosis bladder tumor Histology grade 2 papillary transitional cell carcinoma showing at least superficial smooth muscle invasion and associated with mildly atypical

Sample Type paraffin Amount block Treatment Chemotherapy,R Node Status No Positive Node Radiation Therapy Localized Radiation Therapy,Pelvic Cytovin, Methotrexate and 5FU CEA NA

Save Record

Pathology # H-0723-86 Clinomics ID 000000007P Age/DOB 59 Sex M Collection Date 5/1/86 Location tissue processing are Tube Type Con Medication

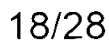
Primary Diagnosis 1) L.T. Hilar mass Bx. Histology needle aspiration biopsies one, two, and three, designated as left hilar mass; small cell undifferentiated carcinoma, intermediate cell type

Record 14 4 7 of 32955

Form View Start Pathol Pathol Search C:\Do... Print Screen NUM 8 30 AM

101

100



Microsoft Excel-ClinNOHRT.xls

[illegible]

Start >> CD Player American Express Spillfire Vis... Microsoft... 4:18 PM

FIG. 11A



19/28

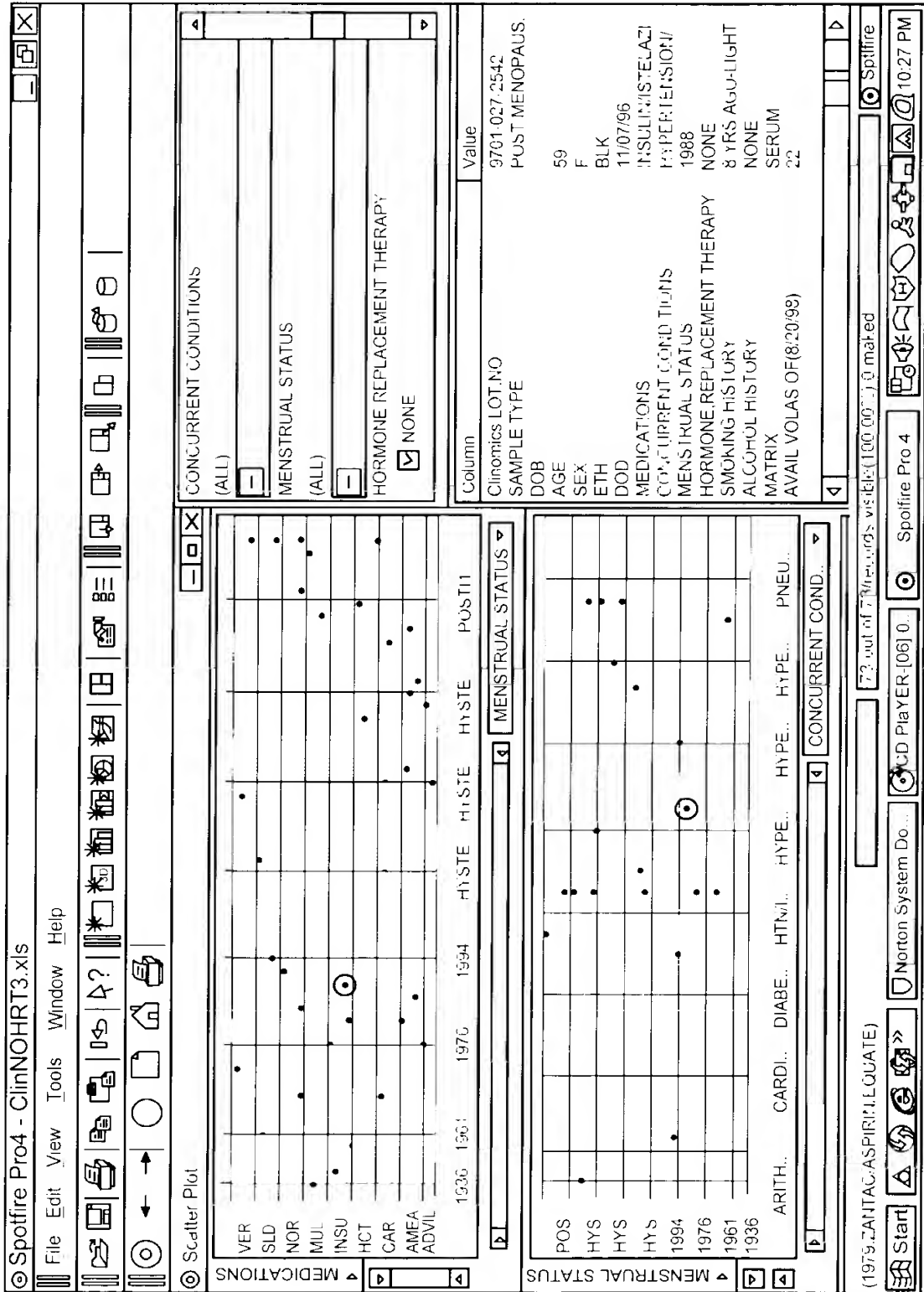


FIG. 11B



20/28

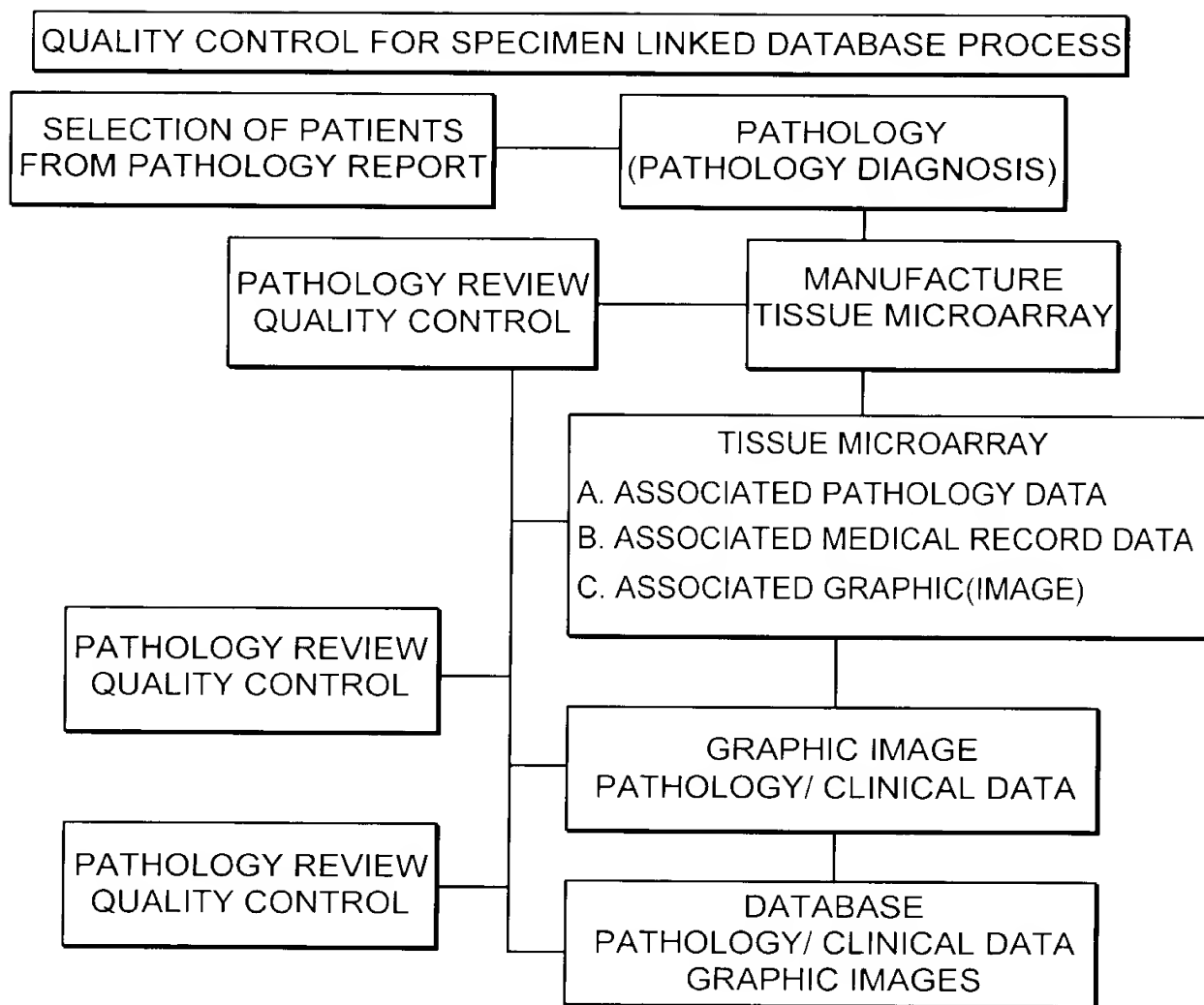


FIG. 12

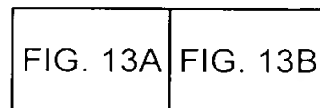


FIG. 13

	SNO-MED ANASITE NUMBERS						
T.02	SKIN	T.41	ARTERY, GENERAL	T.77	PROSTATE	T.Y1	TRUNK, PERINEUM
T.03	SUBCUTANEOUS TISSUE	T.42	AORTA	T.78	TESTES, TUNICA VAGINALIS	T.Y2	THORACIC, DIAPHRAGM
							MEDIASTINUM
T.04	BREAST	T.43	CORONARYARTERY	T.79	SCROTUM, SPERM CORD	T.Y3	THORACIC VISCERA
					EPIDERMIS, VAS DEF	T.Y4	ABDOMEN, PERITONEU
							RETROPERITONEUM
T.06	BONE MARROW	T.44	PULM, ARTERY	T.80	VULVA, LABIUM, CLITORIS	T.Y6	PELVIS
					BARTOLINS GLAND	T.YX	PERITONEAL FLUID
T.07	SPLEEN	T.45	VERT, CAROTID, CEREBR, TEMPOR.	T.81	VAGINA, HYMEN	T.Y1	SYNOVIAL FLUID
			BASILOR ARTERIES			T.2X	UPPER RESP FLDS
T.08	LYMPH NODES	T.46	ILIAC, RENAL, MESSENERIC ARTERY	T.82	UTERUS	T.2Y	LOWER RESP FLDS
T.09	LYMPHATICS	T.47	POPLITEAL ARTERY	T.83	CERVIX	T.6X	GI FLDS, SPACES
T.11	BONE	T.48	VEIN	T.84	ENDOMETRIUM	T.6Y	GI CONTENTS
T.12	SYNOVIUM, JOINT	T.49	VEIN	T.85	MYOMETRIUM	T.7X	URINE TRA, FLO. SPACE
T.13	MUSCLE	T.50	DIGESTIVE SYSTEM	T.86	FALLOPIAN TUBE	T.7Y	MALE GENT FLD, SPACE
T.15	CARTILADGE	T.51	MOUTH, PALATE, ORAL	T.87	OVARY	T.8X	FEM. GENT FLD, SPACE
T.16	BURCA	T.52	LIP	T.88	PLACENTA, UMBCCORD	T.8Y	PLACENTA, FETAL FLD
T.17	TENDON	T.53	TONGUE	T.89	FETUS	T.XO	NERVOUS SYSTEM
T.18	LIGAMENT, FASCIA	T.54	GUM, TOOTH, GINGIVA	T.91	PITUITARY	T.YO	BODY AS A WHOLE
T.19	SOFT TISSUE	T.55	PAROTID, SALIV GLND	T.93	ADRENAL		

FIG. 13A

T.21	NOSE	T.56	LIVER	T.96	THYROID		
T.22	SINUS, ACCESSORY	T.57	GALLBLADDER	T.97	PARATHYROID		
T.23	NASOPHARYNX	T.58	EXTRAHEPATIC BILE DUCT	T.98	THYMUS		
T.24	VOC. CRD. LARY., EPIGLT	T.59	PANCREAS	T.99	ISLET OF LANGERHANS		
T.25	TRACHEA	T.60	PHARYNX	T.0X	BLOOD		
T.26	BRONCHUS	T.61	TONSIL, ADENOIDS	T.1X	FIBRO, ADIPOSE TISSUE		
					CONNECTIVE TISSUE		
T.27	BRONCHIOLE	T.62	ESOPHAGUS	T.Y8	UPPER EXTREM.		
T.28	LUNG	T.63	OMENTUM, STOMACH, PYLORUS	T.Y9	LOWER EXTREM.		
T.29	PLEURA	T.64	SM. INTEST., DUODENUM	T.XY	EAR		
T.30	CARDIO VAS SYS	T.65	JEJUNUM, ILEUM	T.XX	EYE		
T.31	PERICARDIUM	T.66	APPENDIX	T.X1	INTRACRAN. MENINGES		
					CSF, DURAL, VENTRIC SYS		
T.32	HEART	T.67	COLON, MESSETERY	T.X2	CEREBRAL, BRAIN		
					CORPUS CALLOSUM		
T.33	MYOCARDIUM	T.68	RECTUM	T.X3	BASAL GANGLIA		
T.34	ENDOCARDIUM	T.69	ANUS	T.X4	THALAMUS		
T.35	CARDIAC VALVE	T.71	KIDNEY	T.X5	PONS, MIDBRAIN		
T.36	TRICUSPID VALVE	T.72	RENAL PELVIS, COCCYX	T.X6	CEREBELLUM		
T.37	PULMONIC VALVE	T.73	URETER	T.X7	SPINAL CORO		
T.38	MITRIAL VALVE	T.74	BLADDER	T.X8	CRANIAL NERVE, OPTIC		
T.39	AORTIC VALVE	T.75	URETHRA	T.X9	NERVE, VAGUS NERVE		
T.40	BLOOD VESSELS	T.76	PENIS	T.YO	SCALP, ORBITAL		

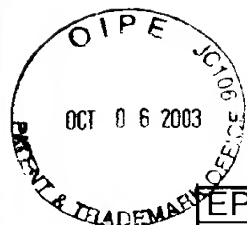
FIG. 13B



23/28

SNO-MED DIAGNOSIS NUMBERS CARCINOM				
ADENOCARCINOMA	M.8143			
ADENOCARCINOMA, ANAPLASTIC	M.8233			
ADENOCARCINOMA, CLEAR CELL	M.8313			
ADENOCARCINOMA, COLLOID	M.8483			
ADENOCARCINOMA, CYSTIC	M.8443			
ADENOSQUAMOUS CARCINOMA	M.8563			
ADENOCARCINOMA, IN-SITU	M.8142			
ADENOCARCINOMA, MUCINOUS CYST	M.8473			
ADENOCARCINOMA, PAPILLARY	M.8263			
ADENOCARCINOMA, UNDIFFER	M.8233			
ADENOCARCINOMA, SIGNET RING	M.8493			
ARRHENBLASTOMA	M.8630			
ANAPLASTIC MALIGNANCY	M.8003			
ASTROCYTOMA, GRADE 1	M.9403			
ASTROCYTOMA, GRADE 2	M.9433			
ASTROCYTOMA, GRADE 3 & 4	M.9443			
ADNEXAL CARCINOMA	M.8393			
ANAPLASTIC CARCINOMA	M.8023			
ADENOID CYSTIC CARCINOMA	M.8203			
ADAMANTINOMA	M.9310			
ALVEOLAR CARCINOMA	M.8253			
ACINAR TUMOR	M.8001			
ACINAR CARCINOMA	M.8553			
BASAL CELL CARCINOMA	M.8093			
BRONCHIOLAR CARCINOMA	M.8253			
BASALOID TRANSITIONAL CARCINOMA	M.8123			
BASAL CELL EPITHELIOMA	M.8090			
CARCINOMA	M.8013			
CARCINOMA, COLLOID	M.8483			
CARCINOMA, IN-SITU	M.8012			
CARCINOMA, PAPILLARY	M.8053			
CARCINOMA, SMALL CELL	M.8043			
CARCINOSARCOMA	M.8983			
CARCINOID, MALIGNANT TUMOR	M.8243			
CARCINOMA, UNDIFFERENTIATED METS	M.8023			
CARCINOMA, UNDIFFERENTIATED	M.8023			
CHORIOCARCINOMA	M.9103			
CARCINOID TUMOR	M.8241			
CHOLANGIOCARCINOMA	M.8163			
CHONDROSARCOMA	M.9223			
CHONDROBLASTOMA	M.9230			
CRANIOPHARYNGIOMA	M.9351			
CYLINDROMA	M.8203			
CYSTADENOCARCINOMA PAPILLARY SEROUS	M.8463			
CYSTADENOCARCINOMA, PAPILLARY	M.8453			
DERMATOFIBROSARCOMA	M.8823			
DYSPLASIA	M.7600			
DUCTAL, INFILTRATING CARCINOMA	M.8503			
EPENDYMOMA	M.9391			

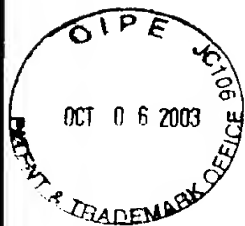
FIG. 14A



24/28

EPIDERMOID CARCINOMA	M.8073			
EMBRYONAL CELL CARCINOMA	M.9073			
EPITHELOMA	M.8110			
EWINGS SARCOMA	M.9263			
FIBROSARCOMA	M.8823			
FOLLICULAR CARCINOMA	M.8333			
GIANT CELL SARCOMA	M.8803			
GIANT CELL TUMOR	M.9040			
GRANULOSA CELL TUMOR	M.8621			
GLIOBLASTOMA, MULTIFORME	M.9443			
GLIOMA	M.9383			
GIANT CELL CARCINOMA	M.8033			
HEMANGIOBLASTOMA	M.9161			
HEPATOBLASTOMA	M.8973			
HISTOCYTOMA	M.8830			
HODGKINS	M.9653			
HODGKINS SARCOMA	M.9683			
HURTLE CELL CARCINOMA	M.8363			
ISLET CELL CARCINOMA	M.8153			
KAPOSI SARCOMA	M.9143			
LEUKEMIA, ACUTE MYELOGENOUS	M.9865			
LEUKEMIA, LYMPHOMA	M.9826			
LEUKEMIA	M.9807			
LEUKEMIA, CHRONIC LYMPHOMA	M.9827			
LEIOMYOSARCOMA	M.8893			
LYMPHOMA, LYMPHOCYTIC	M.9633			
LYMPHOMA, LYMPHOCYTIC	M.9593			
LYMPHOMA, GIANT FOLLICULAR	M.9693			
LYMPHOSARCOMA, LYMPHOCYTIC	M.9623			
LYMPHOMA, MALIGNANT	M.9593			
LYMPHOMA, HISTIOCYTIC	M.9643			
LYMPHERITHELIOMA	M.8083			
LYMPHOMA, T-CELL	M.9703			
LYMPHOSARCOMA, LYMPHOCYTIC	M.9613			
LIPOSARCOMA	M.8853			
LYMPHOMA, STEM CELL	M.9603			
MALIGNANT MELANOMA SPINDLE CELL	M.8773			
MENINGIOMA	M.9530			
METASTATIC CARCINOMA	M.8016			
MALIGNANT TUMOR	M.8003			
METASTATIC MALIGNANT TUMOR	M.8006			
MEDULLOBLASTOMA	M.9473			
MALIGNANT MELANOMA	M.8723			
MALIGNANT CELLS	M.6972			
MYOBLASTOMA	M.9370			
MUCOEPIDERMOID CARCINOMA	M.8433			
MALIGNANT CARCINOID TUMOR	M.8243			
MALIGNANT MESENCHYMOMA	M.8993			
MESOTHELIOMA	M.9051			
MYELOMA	M.9733			
METASTATIC MELANOMA	M.8733			

FIG. 14B



MALIGNANT GRANULOSA CELL TUMOR	M.8623			
MALIGNANT PHEOCHROMOCYTOMA	M.8703			
MALIGNANT MESOTHELIOMA	M.9053			
METASTATIC LEIOMYOSARCOMA	M.8893			
MESODERMAL TUMOR	M.8953			
MIXED TUMOR	M.8940			
NEUROBLASTOMA, NEUROEPITHELIOMA	M.9503			
NECROTIC TUMOR	M.5443			
NEUROBLASTOMA, NEUROEPITHELIOMA	M.9503			
OLIGODENDROGLIOMA	M.9453			
OAT CELL CARCINOMA	M.8043			
OSTEOBLASTOMA	M.9200			
OSTEOMA	M.9180			
OSTEOSARCOMA	M.9183			
OSTEOIDOSTEOMA	M.9190			
OSTEOCHONDROMA	M.9210			
PAPILLARY CARCINOMA	M.8053			
PLASMA CELL MYELOMA	M.9733			
PAPILLARY METASTATIC CYTADENOCARCINOMA	M.8463			
PAPILLARY TRANSITIONAL CELL CARCINOMA	M.8133			
RENAL CELL CARCINOMA	M.2485			
RETICULUM CELL SARCOMA	M.9643			
RENAL CLEAR CELL CARCINOMA	M.8313			
SQUAMOUS CELL CARCINOMA	M.8073			
SARCOMA, RETICULAR CELL	M.8316			
SQUAMOUS EPITHELIAL TUMOR	M.8070			
SQUAMOUS CELL CARCINOMA IN-SITU	M.8072			
SARCOMA, UNDIFFERENTIATED GIANT CELL	M.8803			
SARCOMA, RETICULAR CELL	M.9643			
SPINDLE CELL CARCINOMA	M.8033			
SEMINOMA	M.9063			
STROMAL SARCOMA	M.8933			
TUMOR	M.8001			
TUMORLET	M.8043			
THYMOMA MALIGNANT	M.8583			
TRANSITIONAL CELL CARCINOMA	M.8123			
TERATOMA	M.9081			
VERRICOUS SQUAMOUS CARCINOMA	M.8053			

FIG. 14C

FIG. 15A

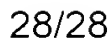
FIG. 15B

FIG. 15C

FIG. 15

AU-99-82	BRAIN	09/05/1957	42	M	CHRONIC PAIN DRUG ABUSE	307.89 305.90	307.89	N/A	FFPE
	(PSYCH)				SEVERE CORONARY ARTERY SCLEROSIS. OLD MYOCARDIAL INFARCTION.	414.00			
					CARDIOMEGALY.				
AU-99-84	BRAIN	05/10/1960	39	F	SEVERE CHRONIC ALCOHOLISM. PREVIOUS HOSPITAL ADMISSION FOR ALCOHOL INTOXICATION AND MAJOR DEPRESSION.	291.89 305.00	291.89 305.00	N/A	FFPE
	(PSYCH)				SEVERE ASCITES(4,000 ML) HEPATOMEGALY(LIVER 1,690 GM)				
					SEVERE CIRRHOSIS.	571.2			
AU-99-90	BRAIN	04/19/1962	37	M	MULTIPLE TRAUMATIC INJURIES SUSTAINED IN A MOTOR VEHICLE ACCIDENT:AVULSION OF SOFT TISSUE, BONE AND BRAIN.				
	(PSYCH)				MULTIPLE COMMUNUTED OPEN FRACTURES OF THE SKULL ALCOHOL INTOXICATION BLOOD ETHANOL LEVEL 252 GM %				
AU-99-91	BRAIN	01/09/2028	71	M	PROSTATE CANCER SQUAMOUS CELL CANCER IT LUNG VENTRICULAR PERITONEAL SHUNT SECONDARY TO PROGRESSIVE HYDROCEPHALUS FROM BRAIN MASS.	185.0 162.9 331.3	293.83	N/A	FFPE
	(ORGANIC)								

FIG. 15B

FIG. 15C